REMARKS

Applicant would like to thank the Examiner for the consideration given the present application. The Office Action of **April 17, 2001**, has been received and its contents carefully noted. Applicant respectfully submits that this response is timely filed and fully responsive to the Office Action.

Claims 14-19 and 31-44 were pending in the present application prior to the aforementioned amendment. By the above actions, claims 14-19 are amended and new claims 45 and 46 are added to recite additional protection to which Applicant is already entitled. Applicant submits that no issue of new matter has been set forth by this Amendment. Accordingly, claims 14-19 and 31-46 are currently pending in the subject application, and are believed to be in condition for allowance at least for the reasons advanced hereinbelow.

Initially, the Office Action maintains the rejection of claim 14 under 35 U.S.C. §102(b) as anticipated by ***Zhang*** (U.S. Patent 5,236,850), and rejects claims 15, 17-18, 33, 35, 36 and 41-44 under 35 U.S.C. §103(a) as unpatentable over ***Liu et al.*** (U.S. Patent 5,147,826) in view of ***Zhang '850***, claims 16, 19, 37, 39 and 40 under 35 U.S.C. §103(a) as unpatentable over ***Yamazaki et al.*** (U.S. Patent 5,773,327) in view of ***Zhang '850***, and claims 31 and 32 under 35 U.S.C. §103(a) as unpatentable over ***Zhang '850***, claim 34 under 35 U.S.C. §103(a) as unpatentable over ***Liu et al. '826*** in view of ***Zhang '850*** and ***Adachi et al.*** (U.S. Patent 5,492,843). By the above actions, claims 14-19 are amended in order to define subject matter which Applicant contends is patentably distinct over the prior art of record.

The claimed invention is directed generally to a method of manufacturing a semiconductor device. More particularly, the claimed invention is directed to method for manufacturing semiconductor device comprising a semiconductor circuit comprising the steps of forming an amorphous semiconductor film through a sputtering method over a

plastic substrate, and crystallizing the amorphous semiconductor film by irradiating with a laser light to form a crystalline semiconductor film. In accordance with the claimed invention as set forth at least in claims 14-19, an inert gas is used as a sputtering gas in the sputtering method, the inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

Note that "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. Of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the...claims." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913 (Fed. Cir. 1989).

Moreover, three criteria must be met to establish a *prima facie* case of obviousness. *M.P.E.P.* §2143. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to achieve the claimed invention. *Id.* Second, there must be a reasonable expectation of success. *In re Rhinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Third, the prior art must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Referring now to the prior art of record, it is contended that the base ***Zhang '850*** patent, either alone or in combination with the ***Liu et al. '826***, ***Yamazaki et al. '327*** or ***Adachi et al. '843*** patents, fails to expressly teach or inherently describe each and very element as set forth in independent claims 14-19 as presently amended. For instance, claims 14-19 each recite a method step of forming an amorphous semiconductor film through a sputtering method over a plastic substrate. The use of a plastic substrate is advantageous over the prior art of record since it obviates the need for high temperature

annealing in order to crystallize the amorphous semiconductor film formed by the sputtering method. As a result, the step of performing laser irradiation is advantageous when crystallizing the amorphous semiconductor film because thermal annealing at high temperatures is not needed.

Applicant respectfully contends that such a feature is neither expressly taught or implicitly described in the base ***Zhang '850*** patent since ***Zhang '850*** teaches at column 3, lines 33-37 to thermally anneal an amorphous silicon film at a temperature between 450°C to 750°C, e.g., 600°C for 96 hours. Moreover, neither of the ***Liu et al. '826***, ***Yamazaki et al. '327***, and ***Adachi et al. '843*** patents modifies the teachings of ***Zhang '850*** in a manner that renders the claimed invention obvious since they too fail to teach the claimed method step of forming an amorphous semiconductor film through a sputtering method over a plastic substrate.

Accordingly, since the prior art of record fails to expressly teach or inherently describe every claim limitation necessary to support anticipation under §102 or *prima facie* case of obviousness under §103, it is respectfully requested that the rejection be reconsidered and withdrawn.

Please note that new claims 45 and 46 have been added to recite subject matter Applicant contends is patentably distinct over the prior art of record. In particular, claims 45 and 46 recite that the base film and the amorphous semiconductor film are formed in succession without exposure to the atmosphere. Because base claims 14 and 17 are believed to be patentable over the prior art of record, and claims 45 and 46 incorporate by reference all of the subject matter recited therein, Applicant contends that these claims are in condition for allowance.

For at least the foregoing reasons, it is respectively asserted that the pending claims are in proper condition for allowance. Reconsideration of these claims in view of the above comments is respectively requested. If the Examiner feels that any further

discussions would be beneficial in this matter, it is requested that the undersigned be contacted.

Respectfully submitted,

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Marked-up copy of amended claims.

14. (Amended) A method for manufacturing semiconductor device comprising a semiconductor circuit, said method comprising the steps of:

forming a base film on a plastic substrate;

forming [a] an amorphous semiconductor film through a sputtering method on the base film; and

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

15. (Amended) A method for manufacturing a semiconductor device comprising a semiconductor circuit, said method comprising the steps of:

forming [a] an amorphous semiconductor film through a sputtering method [on an insulating surface] over a plastic substrate;

adding a catalytic element into at least a portion of the semiconductor film, said catalytic element being capable of promoting crystallization; and

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

16. (Amended) A method for manufacturing a semiconductor device comprising a semiconductor circuit, said method comprising the steps of:

forming an amorphous semiconductor film comprising silicon and germanium through a sputtering method [on an insulating surface] over a plastic substrate;

adding a catalytic element into at least a portion of the semiconductor film, said catalytic element being capable of promoting crystallization;

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

17. (Amended) A method for manufacturing a semiconductor device comprising a semiconductor circuit, said method comprising the steps of:

forming a base film on a plastic substrate;

forming a gate wiring on the base film;

forming a gate insulating film on the gate wiring;

forming [a] an amorphous semiconductor film through a sputtering method on the gate insulating film;

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

18. (Amended) A method for manufacturing a semiconductor device comprising a semiconductor circuit, said method comprising the steps of:

forming a gate wiring [an insulating surface] over a plastic substrate;

forming a gate insulating film on the gate wiring;

forming [a] an amorphous semiconductor film through a sputtering method on the gate insulating film;

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.

19. (Amended) A method for manufacturing an electroluminescence display device comprising at least a thin film transistor, said method comprising the steps of:

forming [a] an amorphous semiconductor film through a sputtering method [on an insulating surface] over a plastic substrate;

crystallizing the semiconductor film by irradiating with a laser light to form a crystalline semiconductor film;

forming a gate insulating film adjacent to the crystalline semiconductor film;

forming a gate electrode adjacent to the crystalline semiconductor film with the gate insulating film interposed therebetween;

introducing an impurity region into the crystalline semiconductor film to form at least a source region, a drain region and a channel region between the source and drain regions;

forming at least an interlayer insulating film over the thin film transistor;

forming a pixel electrode over the interlayer insulating film, said pixel electrode being electrically connected to the drain region of the thin film transistor;

forming an EL layer adjacent to the pixel electrode;

forming a cathode adjacent to the EL layer,

wherein an inert gas is used as a sputtering gas in the sputtering method, said inert gas being at least one gas selected from the group consisting of Ar, He, Ne and N.